ATTORNEY DOCKET NO.

1321-P054WOUS

## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

application of:

James M. Tour et al.

Serial No.:

SEP 1 1, 2007

10/521,903

Filing Date:

July 15, 2003

Art Unit:

1754

Examiner:

N/Y/A

Title:

Process for Functionalizing Carbon Nanotubes Under Solvent-Free

Conditions

Mail Stop: Amendment Commissioner for Patents P.O. Box 1450 Alexandria, VA 22313-1450

Sir:

# SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

### **UNDER 37 C.F.R. § 1.97(b)**

Applicant hereby submits this Supplemental Information Disclosure Statement and following references in accordance with 37 C.F.R. §§ 1.56, 1.97 and 1.98. Copies of the references cited in the attached PTO/SB/08B are enclosed for the examiner's reference. Furthermore, pursuant to 37 C.F.R. § 1.97(g) and (h), no representation is made that this is material to patentability of the present application or that a search has been made.

Applicant hereby submits that claims of Applicant's referenced patent application are patentably distinguishable from these references.

ATTORNEY DOCKET NO. 11321-P054WOUS

Applicant does not believe that any fees are due at this time; however, the Director of Patents and Trademarks is hereby authorized to charge any fees relating to this Information Disclosure Statement under 37 CFR § 1.17 to Deposit Account No. 23-2426 of WINSTEAD SECHREST & MINICK P.C. (referencing matter 11321-P054WOUS).

Respectfully submitted,

Date: 6 September 206)

Victor Behar, Reg. No. 60,691

AGENT FOR APPLICANT

WINSTEAD PC P.O. Box 50784 Dallas, Texas 75201

Phone: 713.650.2632 Fax: 214.745.5390

#### **CERTIFICATE OF MAILING**

I hereby certify that the attached *Information Disclosure Statement* and cited art are being deposited with the USPS, with sufficient postage as first class mail, addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this the 6th day of September 2007.

Date 0 2007

Cherita Grimstead

931681v.1 11321/P054WOUS

PTO/SB/08A (04-03)

Approved for use through 04/30/2003. OMB 0651-0031 U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

r the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number

ubstitute for form 1449/PTO

SEP 1 1 2007

RATE TRAD

# INFORMATION DISCLOSURE STATEMENT BY APPLICANT

(Use as many sheets as necessary)

Col	mplete if Known	
Application Number	10/521,903	
Filing Date	July 15, 2003	
First Named Inventor	James M. Tour	
Art Unit	1754	
Examiner Name	Unknown	
Attorney Docket Number	11321-P054WOUS	

			U. S. PATEN	T DOCUMENTS		
Examiner Initials*	Cite No.1	Document Number  Number-Kind Code <sup>2 (f known)</sup>	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	
		<sup>US-</sup> 6,841,139	01-11-2005	Margrave et al		
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-				
		US-		† .		
		US-				
		US-				
		US-		-		
		US-				
		US-				
		US-				

Examiner Initials*	Cite No.1	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	Γ
		Country Code <sup>3</sup> Number <sup>4</sup> Kind Code <sup>5</sup> (if known)	MM-DD-YYYY	, pp. sain of once occasion	Or Relevant Figures Appear	1
	1	WO 02/060812	08/08/02	Tour et al.		
	2	WO 98/39250	09/11/98	Smalley et al.		
	3	WO 00/26138	05/11/00	Smalley et al.		Г
	4	WO 01/30694	05/03/01	Smalley et al.		
						Г

Examiner	(Carana Hanay)	Date	10/10/0007
Signature	/Serena Hanor/	Considered	12/10/2007
		Considered	i

\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. Applicant's unique citation designation number (optional). See Kinds Codes of USPTO Patent Documents at <a href="https://www.uspto.gov">www.uspto.gov</a> or MPEP 901.04. Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST. 16 if possible. Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Index the Panerwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMR control number

Substitut	NFORMATION DISCLOSUR				Complete if Known
				Application Number	10/521,903
INFO	DRMATION	DIS	CLOSURE	Filing Date	July 15, 2003
STA	TEMENT B	Y A	PPLICANT	First Named Inventor	James M. Tour
	(Use as many she	ate ae ni	erassarvi	Art Unit	1754
	(occ ac many one		ooooury)	Examiner Name	Unknown
Sheet	2	of	6	Attorney Docket Number	11321-P054WOUS

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	5	Ebbesen et al., "Large-scale synthesis of carbon nanotubes" 358 Nature (1992), pp. 220-222	:
	6	Ebbesen et al., "Carbon Nanotubes", 24 Annual Review of Materials Science (1994), pp. 235-264	
	7	lijima et al., "Helical microtubes of graphitic carbon" 354 Nature (1991), pp. 56-58	
	8	Saito et al., Physical Properties of Carbon Nanotubes, 1998, London: Imperial College Press	
	9	Sun et al., "Creating the narrowest carbon nanotubes" 403 Nature (2000), pg. 384	
	10	Qin et al., "Electron Microscope imaging and contrast of smallest carbon nanotubes", 349 Chem. Phys. Lett. (2001), pp. 389-393	
	11	Wang et al., "The smallest carbon nanotube", 408 Nature (2000), pp. 50-51	
	12	Hafner et al., "Catalytic growth of single-wall carbon nanotubes from metal particles" 296 Chem. Phys. Lett. (1998), pp. 195-202	
	13	Cheng et al., "Bulk morphology and diameter distribution" 289 Chem. Phys. Lett. (1998), pp. 602-610	
	14	Nikolaev et al., "Gas-phase catalytic growth of single-walled carbon nanotubes"313 Chem. Phys. Lett. (1999), pp. 91-97	

Examiner	/Serena Hanor/	Date	12/10/2007
Signature	7001011a Hallott	Considered	12/10/2007

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:

Substitut	te for form 1449/PTO			Complete if Known		
				Application Number	10/521,903	
			CLOSURE	Filing Date	July 15, 2003	
STA	TEMENT	BY A	PPLICANT	First Named Inventor	James M. Tour	
	(Use as many sh	ieets as n	ecessarvi	Art Unit	1754	
				Examiner Name	Unknown	
Sheet	3	of	6	Attorney Docket Number	11321-P054WOUS	

Examiner	Cito	NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. <sup>1</sup>	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
	15	Thess et al., "Crystalline Ropes of Metallic Carbon Nanotubes" 273 Science (1996), pp. 483-487	
	16	Vander Wal et al., "Flame and furnace synthesis of single-walled and multi-walled carbon nanotubes", 105 J. Phys. Chem. B. 42 (2001), pp. 10249-10256	
	17	Rao, et al., "Functionalised carbon nanotubes from solutions" Chem. Commun. (1996),pp. 1525-1526	
	18	Wong, et al., "Covalently functionalized nanotubes as nanometresized probes in chemistry and biology", 394 Nature (1998), pp. 52-55	
	19	Liu, et al., "Fullerene Pipes" 280 Science (1998), pp. 1253-1256	
	20	Chen, et al., "Solution Properties of Single-Walled Carbon Nanotubes", 282 Science (1998), pgs. 95 98	
	21	Aihara, "Lack of Superaromaticity ib=n Carbon nanotubes", 98 J. Phys. Chem. (1994), pgs. 9773-9776	
	22	Chen, Y. et al., "Chemical attachment of organic and functional groups to single-walled carbon nanotube material", 13 J. Mater Res. (1998), pp. 2423-2431	
	23	Bahr et al., "Covalent chemistry of single-wall carbon nanotubes", 12 J. Mater. Chem. (2002), pp. 1952-1958	
	24	Banerjee et al., "Rational Chemical Strategies for Carbon Nanotube Functionalization", 9 Chem. Eur. J.(2003), pgs. 1899-1908	

Examiner   /Serena Hanor/	Date Considered	12/10/2007
---------------------------	--------------------	------------

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

<sup>1</sup> Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.

Substitut	e for form 1449/PTO			Complete if Known		
				Application Number	10/521,903	
INFO	DRMATION	DIS	CLOSURE	Filing Date	July 15, 2003	
STA	STATEMENT BY APPLICANT			First Named Inventor	James M. Tour	
	(Use as many she	ete se n	ecassary)	Art Unit	1754	
	(Jose do Many one			Examiner Name	Unknown	
Sheet	4	of	6	Attorney Docket Number	11321-P054WOUS	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No.1	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T <sup>2</sup>
	25	Holzinger et al., "Sidewall Functionalization of Carbon Nanotubes", 40 Angew. Chem. Int. Ed. 21 (2001), pp. 4002-4005	
	26	Bahr et al., "Dissolution of small diameter single-wall arbon nanotubes in organic solvents", Chem. Commun. (2001), pgs. 193-194	
	27	Tanaka et al., "Solvent-Free Organic Synthesis", 100 Chem. Rev. (2000), pp. 1025-1074	
	28	Georgakilas et al., "Organic Functionalization of Carbon Nanotubes", 124 J. Am. Chem. Soc., 5 (2002), pp. 760-761	
	29	Meier et al., "Addition of Nitrile Oxides to C60: Formation of Isoxazolene Derivatives of Fullerenes", 58 J. Org. Chem. (1993), pgs. 4524	
	30	Belik et al., "Diels-Alder Adduct of C60 and 4-Carboxy-o-quindimethane: Synthesis and Chemical Transformations", 60 J. Org. Chem. Soc. (1995), pgs. 3307-3310	
	31	Hirsch et al., "Fullerene Chemistry in Three Dimensions: Isolation of Seven Regioisomeric Bisadducts and Chiral Trisadducts of C60 and Di(ethoxycarbonyl) methylene", 33 Angew. Chem. Int. Ed. (1994), pgs. 437-438	
	32	Liang et al., "Electronic Structures and Optical properties of Open and capped Carbon nanotubes", 122 J. Am. Chem. Soc. (2000), pgs. 11129-11137	
	33	Jost et al., "Diameter grouping in bulk samples of single-walled carbon nanotubes from optical absorption spectroscopy", 75 J. Appl. Phys. Lett. (1999), pgs. 2217-2219	
	34	Wu et al., "Finite size effects in carbon nanotubes", 77(16) Appl. Phys. Lett. (2000), pgs. 2554-2556	

Examiner Signature /Serena Hanor/ Date 12/10/2007 Considered
--

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:

Substitute for form 1449/PTO				Complete if Known		
				Application Number	10/521,903	
			CLOSURE	Filing Date	July 15, 2003	
STA	STATEMENT BY APPLICANT			First Named Inventor	James M. Tour	
(Use as many sheets as necessary)				Art Unit	1754	
				Examiner Name	Unknown	
Sheet	5	of	6	Attorney Docket Number	11321-P054WOUS	

		NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. <sup>1</sup>		
	35	Richter et al., "Theory of Size-Dependent Resonance Raman Scattering from Carbon Nanotubes", 79 Phys. Rev. Lett., Science (1997), pgs. 2738-2740	
	36	Rao et al., "Diameter-Selective Raman Scattering from Vibrational Modes in Carbon Nanotubes", 275 Science (1997), pp. 187-191	
	37	Li et al., "Temperature dependence of the Raman spectra of single-wall carbon nanotubes", 76 Appl. Phys. Lett. (2000), pgs. 2053-2055	
	38	Chiang et al., "Purification and Characterization of Single-Wall Carbon Nanotubes", 105 J. Phys. Chem. B (2001), pgs. 8297-8301	
	39	Bahr et al., "Functionalization of Carbon nanotubes by Electrochemical Reduction of Aryl Diazonium Salts: A Bucky Paper Electrode", 123 J. Am. Chem. Soc. (2001), pgs. 6536-6542	
	40	Bahr et al., "Highly Functionalized Carbon Nanotubes Using in Situ Generated Diazonium Compounds", 13 Chem. Mater. (2001), pgs. 3823-3824	
	41	Niyogi et al., "Chemistry of Single-Walled Carbon Nanotubes", 35 Acc. Chem. Res. (2002), pgs. 1105-1113	
	42	Hirsch, "Functionalization of Single-Walled Carbon Nanotubes", 41, No. 11, Angew. Chem. Int. Ed., (2002), pgs.1853-1859	
	43	Meier et al., "Benzyne Adds Across a Closed 5-6 Ring Fusion in C70: Evidence for Bond Delocalization in Fullerenes", 120 J. Am. Chem. Soc. (1998), pgs. 2337-42	
	44	Himeshima et al., "Fluoride-Induced 1,2-Elimination of O-Trimethylsilyl-Phenyl Triflate to Benzyne Under Mild Conditions", Chem. Soc. of Japan (1983), pgs. 1211-1214	

Examiner	/Serena Hanor/	Date	12/10/2007
Signature		Considered	12/10/2007

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached.

This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO:

Substitute for form 1449/PTO				Complete if Known		
	•			Application Number	10/521,903	
INFO	DRMATION	I DIS	CLOSURE	Filing Date	July 15, 2003	
STA	STATEMENT BY APPLICANT			First Named Inventor	James M. Tour	
(Use as many sheets as necessary)				Art Unit	1754	
				Examiner Name	Unknown	
Sheet	6	of	6	Attorney Docket Number	11321-P054WOUS	

Examiner	Cite	NON PATENT LITERATURE DOCUMENTS  Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of	
nitials*	No.1	the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
	45	Mitchell et al., "Dispersion of Functionalized Carbon Nanotubes in Polystyrene", 35 Macromolecules (2002), pgs. 8825-8830	
<u>-</u> -			

Examiner	/Serena Hanor/	Date	10/18/0007
Signature		Considered	12/10/2007

<sup>\*</sup>EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.

If you need assistance in completing the form, call 1-800-PTO-9199 (1-800-786-9199) and select option 2.

Applicant's unique citation designation number (optional). 2 Applicant is to place a check mark here if English language Translation is attached. This collection of information is required by 37 CFR 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 120 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, Washington, DC 20231. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, Washington, DC 20231.